In the Claims

Applicant has submitted a new complete claim set showing marked up claims with insertions indicated by underlining and deletions indicated by strikeouts and/or double bracketing.

1. (Original) A method comprising:

establishing a first electromagnetic radiation diffraction pattern resulting from interaction of electromagnetic radiation with a system including separate portions of a first sample;

changing the first sample to a second sample and establishing a second diffraction pattern resulting from interaction of electromagnetic radiation with the system including a second sample; and

determining the difference between the first and second diffraction patterns.

2. (Original) A method comprising:

exposing separate portions of a first sample to electromagnetic radiation, without exposing any portion of the first sample between the separate portions to the electromagnetic radiation, and determining absorption of the electromagnetic radiation by the first sample;

exposing separate portions of a second sample to electromagnetic radiation, without exposing portions of the second sample between the separate portions to the electromagnetic radiation and determining absorption of the electromagnetic radiation by the second sample; and

determining a difference in absorption of the second sample as compared to the first sample.

3. (Original) A method as in claim 2, further comprising establishing a first diffraction pattern resulting from interaction of electromagnetic radiation with a system including the separate portions of the first sample;

establishing a second diffraction pattern resulting from interaction of the electromagnetic radiation with the system including the second sample; and

determining the difference between the first and second diffraction patterns.

4. (Previously Amended) A method as in claim 1, wherein at least one of the first and second samples is two-dimensionally variant.

5. (Previously Amended) A method as in claim 1, wherein the separate portions of the first sample are isolated from each other, and the separate portions of the second sample are isolated from each other.

6. (Previously Amended) A method as in claim 1, wherein the separate portions of the first sample are exposed to electromagnetic radiation without exposing any portion of the first sample between the separate portions to the electromagnetic radiation, and separate portions of the second sample are exposed to electromagnetic radiation without exposing portions of the second sample between the separate portions to the electromagnetic radiation.

7. (Previously Amended) A method as in claim 1, involving determining absorption of the electromagnetic radiation by each of the first and second samples and determining a difference in absorption of the second sample compared with the first sample.

8. (Original) A method as in claim 7, involving simultaneously determining the first diffraction pattern and absorption of the first sample, and simultaneously determining the second diffraction pattern and absorption of the second sample.

9. (Previously Amended) A method as in claim 1, wherein the first and second samples are different fluids.

10. (Original) A method as in claim 9, wherein the first and second samples contain different concentrations of a species.

11. (Original) A method as in claim 9, wherein the first and second samples contain different species.

12. (Original) A method as in claim 9, wherein the first and second samples differ in absorption.

13. (Original) A method as in claim 12, wherein the first and second samples differ in refractive index.

14. (Original) A method as in claim 9, wherein the first and second samples differ in refractive index.

15. (Previously Amended) A method as in claim 1, wherein each of the first and second samples comprises a series of elongate, essentially parallel sections.

16. (Original) A method as in claim 15, wherein each of the first and the second samples is a different fluid.

17. (Original) A method as in claim 15, wherein the elongate sections comprise a series of different blocks of fluid.

18. (Previously Amended) A method as in claim 1, wherein each of the first and second samples is two-dimensionally variant, and the diffraction pattern is two-dimensionally variant.

19. (Original) A method as in claim 15, further comprising urging the sections in an axial direction thereby positioning the first sample at an axial location, and subsequently positioning the second
sample at the same axial location.

20. (Original) A method as in claim 19, involving urging the sections in an axial direction via physical pressure.

21. (Original) A method as in claim 19, comprising urging the sections in an axial direction via electroosmosis.

22. (Previously Amended) A method as in claim 1, wherein each of the first and second samples is positioned in elongate voids in an article that is at least partially transparent to the electromagnetic radiation.

23. (Original) A method as in claim 22, wherein each of the first and second samples is positioned in indentations in a first chamber component including a plurality of protrusions and intervening indentations, the protrusions being sealed to a surface of a second chamber component.

24. (Previously Amended) A method as in claim 1, wherein each of the first and second samples is positioned in isolated, essentially parallel channels in a sample chamber.

25. (Original) A method as in claim 23, wherein the sample chamber includes at least one interior sample surface that is flexible.

26. (Original) A method as in claim 23, wherein the sample chamber includes at least one interior sample surface that is polymeric.

27. (Original) A method as in claim 23, wherein the sample chamber includes at least one interior sample surface that is elastomeric.

28. (Previously Amended) A method as in claim 1, wherein each of the first and second samples is positioned in isolated, essentially parallel channels in a sample chamber that is essentially transparent to the electromagnetic radiation.

29 – 51. (Cancelled)

52. (Currently Amended) A system comprising:

a sample system constructed and arranged to deliver a sample via a sample inlet and to position first and second portions of ~~a~~ the sample separately and in isolation from each other;

at least one source of electromagnetic radiation positioned to irradiate the first and second portions; and

at least one absorption detector positioned to detect absorption of the first and second portions.

53. (Currently Amended) A system comprising:

a sample system constructed and arranged to position first and second portions of a first sample separately and in isolation from each other;

a source of electromagnetic radiation positioned to irradiate the first and second portions;

a detector positioned to determine diffraction of the electromagnetic radiation by the first and second portions; and

a pump constructed and arranged to displace the first sample with a second sample.

54. (Original) A system as in claim 53, wherein the detector is constructed and arranged to detect a one-dimensional diffraction pattern.

55. (Original) A system as in claim 53, wherein the detector is constructed and arranged to detect a two-dimensional diffraction pattern.

56. (Currently Amended) A system comprising ~~as in claim 52, wherein the sample system comprises~~:

a sample chamber constructed and arranged to position ~~the~~ first and second portions of ~~the~~ a sample separately and in isolation;

at least one source of electromagnetic radiation positioned to irradiate the first and second portions; and

at least one absorption detector positioned to detect absorption of the first and second portions.

57. (Original) A system as in claim 56, wherein the sample chamber includes an interior chamber surface that is flexible.

58. (Original) A system as in claim 56, wherein the sample chamber includes an interior chamber surface that is polymeric.

59. (Original) A system as in claim 56, wherein the sample chamber includes an interior chamber surface that is elastomeric.

60. (Original) A system as in claim 53, wherein the sample chamber is formed of a first chamber component and a second chamber component sealed to each other via plasma activation in the absence of auxiliary adhesive.

61. (Original) A system as in claim 52, wherein the sample system comprises a sample chamber including a plurality of essentially parallel, elongate channels.

62. (Original) A system as in claim 61, wherein the channels comprise at least five channels.

63. (Original) A system as in claim 61, further comprising a pump constructed and arranged to urge samples through the channels.

64. (Original) A system as in claim 63, wherein the pump is an electroosmotic pump.

65. (Original) A system as in claim 64, wherein the electroosmotic pump comprises electrodes, in each channel, spaced axially in the channel.

66. (Original) A system as in claim 65, wherein the electrodes are pre-fabricated on a chip and the sample chamber is defined by the chip and a cover on the chip.

67. (Original) A system comprising:

a sample chamber defined by an elastomeric article having a first surface including a plurality of protrusions and indentations, outward-facing surfaces of the protrusions forming a seal against a surface of a second article, the indentations and portions of the surface of the second article defining a plurality of elongate, essentially parallel fluid channels constructed and arranged to receive a fluid and to pass the fluid through the channels;

a pump constructed and arranged to urge a sample through the channels;

at least one source of electromagnetic radiation positioned to irradiate a sample in the sample chamber channels;

a detector positioned to determine absorption of electromagnetic radiation directed at a sample in the sample chamber channels; and

a diffraction detector positioned to detect diffraction of electromagnetic radiation directed at a sample in the sample chamber channels.

68. (Original) A system as in claim 67, constructed and arranged to simultaneously determine absorption of electromagnetic radiation directed at a sample in the sample chamber channels and diffraction of electromagnetic radiation directed at a sample in the sample chamber channels.

69. (Original) A system as in claim 68, constructed and arranged to simultaneously determine absorption of electromagnetic radiation directed at a sample in the sample chamber channels and diffraction of electromagnetic radiation directed at a sample in the sample chamber channels, and to simultaneously determine absorption of electromagnetic radiation directed at a second sample in the sample chamber channels and diffraction of electromagnetic radiation directed at a second sample in the sample chamber channels and to determine a difference in absorption of the first sample compared with the second sample and to determine a difference in diffraction of the first sample compared to the second sample.

70 - 107. (Cancelled)